

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

SRM Number: 1879a
MSDS Number: 1879a
SRM Name: Respirable Cristobalite
(Quantitative X-Ray Powder
Diffraction Standard)

Date of Issue: 21 September 2005

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Description: Standard Reference Material (SRM) 1879a is intended for use in preparation of calibration standards for quantitative analyses of cristobalite by X-ray powder diffraction in accordance to National Institute for Occupational Safety and Health (NIOSH) Analytical Method 7500 or equivalent. A unit of SRM 1879a consists of approximately 5 g of powder bottled under argon.

Substance: Respirable Cristobalite

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Cristobalite
Other Designations:	Cristobalite (alpha-cristobalite; alpha-cristobalite; crystoballite; cristoballite; cristobalite; metacristobalite; silica, crystalline-cristobalite; silicic anhydride)
CAS Number:	14464-46-1
EC Number (EINECS):	238-455-4
SRM Nominal Concentration:	88 (mass fraction in %)
EC Classification:	T
EC Risk:	R49
EC Safety:	S2, S24, S46
EC Risk/Safety Phrases:	See Section 15, "Regulatory Information".

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: Cancer hazard (in humans).

Potential Health Effects

Inhalation: Acute exposure to high concentrations of cristobalite dust may cause physical discomfort of the upper respiratory tract.

Skin Contact: Acute exposure to intact skin may cause irritation and abrasion due to mechanical action.

Eye Contact: Acute exposure to cristobalite to the eye may cause irritation due to mechanical action.

Ingestion: Effects as a result of ingestion of cristobalite are due to mechanical action. Crystalline silicas are biologically inert.

**Listed as a Carcinogen/
Potential Carcinogen:**

Yes No

X In the National Toxicology Program (NTP) Report on Carcinogens.

X In the International Agency for Research on Cancer (IARC) Monographs.

 X By the Occupational Safety and Health Administration (OSHA).

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing by qualified personnel. Get immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention if necessary.

Eye Contact: Flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Cristobalite is a negligible fire hazard.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Fire Fighting: Move container from fire area if possible without exposure to risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point: Not applicable.

Method Used: Not applicable.

Autoignition Temperature: Not applicable.

Flammability Limits in Air

Upper (Volume %): Not applicable.

Lower (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Collect the material in an appropriate container for proper disposal. Avoid generating dust. If necessary, use a high-efficiency particulate filter vacuum to clean up residue. Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65); Keep out of water and sewer supplies.

Disposal: See Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage:	Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.
Safe Handling Precautions:	Avoid generating dust when handling. See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:	OSHA: 0.05 mg/m ³ TWA (respirable dust) ACGIH (TLV): 0.05 mg/m ³ TWA (respirable particulate) NIOSH: 0.05 mg/m ³ recommended TWA (respirable particulate) MEL UK: 0.3 mg/m ³ TWA (respirable particulate)
Ventilation:	Use a local exhaust ventilation system. Ensure compliance with applicable exposure limits.
Respirator:	For conditions of frequent use or heavy exposure where exposure is apparent and engineering controls are not feasible, respirator protection may be needed. Refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.
Eye Protection:	Wear safety goggles. An eye wash station should be readily available near areas of use.
Personal Protections:	Wear appropriate chemical resistant clothing and gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component:	Cristobalite
Appearance and Odor:	White. Powder. Odorless.
Molecular Weight:	60.09 g/mol
Molecular Formula:	SiO ₂
Density:	2.32 g/cm ³
Solvent Solubility:	Soluble in hydrofluoric acid and molten alkali. Slightly soluble in alkali. Insoluble in organic solvents.
Water Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability:	<u> X </u> Stable <u> </u> Unstable Stable at normal temperatures and pressure.
Conditions to Avoid:	Avoid generating dust.
Incompatible Materials:	Oxidizing materials. Acids. Bases. Combustible materials.
Fire/Explosion Information:	See Section 5, "Fire Fighting Measures".
Hazardous Decomposition:	Thermal decomposition may produce miscellaneous decomposition products.
Hazardous Polymerization:	<u> </u> Will Occur <u> X </u> Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry:	<u> X </u> Inhalation <u> </u> Skin <u> X </u> Ingestion
Toxicity Data:	Rat, Intratracheal LD ₅₀ : 200 mg/kg Mouse, Inhalation-intermittent TC ₅₀ : 43 mg/m ³ (5 h to 19 d)
Carcinogenic, Tumorigenic Data:	Cristobalite is recognized by NTP as a known human carcinogen; Recognized by IARC as Human and Animal Sufficient Evidence, Group 1 Carcinogen (Crystalline silica). Cristobalite has been investigated as a tumorigenic effector.
Medical Conditions Aggravated by Exposure:	Respiratory disorders.
Health Effects (Acute and Chronic):	See Section 3, "Hazards Identification".

12. ECOLOGICAL INFORMATION

Ecotoxicity:	Not available.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal:	Dispose in accordance with federal, state, and local regulations.
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14. TRANSPORTATION INFORMATION

U.S. DOT and IATA:	Not regulated by DOT or IATA.
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15. REGULATORY INFORMATION

U.S. Regulations:	CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated. SARA Title III Section 302 (40 CFR 355.30): Not regulated. SARA Title III Section 304 (40 CFR 355.40): Not regulated. SARA Title III, Section 313 (40 CFR 372.65): Not regulated. OSHA Process Safety (29 CFR 1910.119): Not regulated. California Proposition 65: Airborne particles (respirable size) of crystalline silica is known by the state of California to cause cancer (1988). SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21): ACUTE: No. CHRONIC: Yes. FIRE: No. REACTIVE: No. SUDDEN RELEASE: No.
CANADIAN Regulations:	WHMIS Classification: Not determined.
National Inventory Status:	U.S. Inventory (TSCA): Listed on inventory. TSCA 12b Export Notification: Not listed.

EC Classification:	T	Toxic
EC Risk and Safety Phrases:	R49	May cause cancer by inhalation.
	S2	Keep out of reach of children.
	S24	Avoid contact with skin.
	S46	If swallowed, seek medical advice immediately and show container or label.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Cristobalite* 09 December 2004.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.